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EXAMINER	
YUAN, KATHLEEN S	
ART UNIT	PAPER NUMBER
2624	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/619,943	PETERSON ET AL.	
	Examiner	Art Unit	
	Kathleen S. Yuan	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20-26* is/are allowed.

6)☐ Claim(s) *1,3-19,27,28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/18/2007*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The response received on 12/18/2007 has been placed in the file and was considered by the examiner. An action on the merit follows.

Response to Amendment

1. The amendments filed on 18 December 2008 have been fully considered. Response to these amendments is provided below.

Response to Arguments/ Amendments and Examiner's Response:

2. The applicants have amended all independent claims except for claim 1.

3. The applicant argues for claim 1 "Fujimori discloses that the reference data is design data. However, design data, the reference data of Fujimori, is not a reference member value of a member of a set of lithographic variables as presently claimed. For instance, design data is not a value of illumination focus, exposure, degree of partial coherence, numerical aperture, or any other lithographic variable. In addition, Fujimori does not teach or suggest that the design data is a value of illumination focus, exposure, degree of partial coherence, numerical aperture, or any other lithographic variable. Therefore, contrary to the assertions in the Office Action, the reference data, DR, of Fujimori is not a reference member value as presently claimed. As such, Fujimori cannot be combined with Shykind and Ferguson as contended in the Office Action to overcome deficiencies in the teachings of Shykind and Ferguson...the reference data of Fujimori is not a 'reference' as previously claimed."

4. The examiner disagrees. The examiner is led to believe that the applicant has misunderstood the examiner's rejection. Hopefully, the explanation that follows will clarify the rejection. Fujimori is not added to teach the specifics of illumination focus, exposure, etc, since Shykind already teaches this. What Fujimori discloses is that the use of reference data is used to compare to other input data. Design/ reference data is paralleled to reference values because design data is the "ideal" data that is used to compare to other data, which would inherently be data with the optimal processing conditions. To summarize, Shykind teaches the use of different process conditions such as exposure time and focus setting, and comparing different values of a member of a set using different process conditions. Fujimori teaches that it is common and known that one of the items to be compared is reference/ design data. Therefore, the rejection is maintained.

5. All other claims are amended, and the arguments are moot in grounds of new rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 3-7, 9, 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6701004 (Shykind et al) in view U.S. Patent No. 5932377 (Ferguson et al), and further in view of U.S. Patent No 5046109 (Fujimori et al).

Regarding claim 1, Shykind et al discloses a method, comprising: acquiring images of a reticle (fig. 3) containing a design pattern by a detection circuit (fig. 2, item 204), wherein the images are acquired for different values of a member of a set of lithographic variables (fig. 8, item 300), the different values of a member of a set of lithographic variables being the different process conditions such as exposure time and focus setting; and determining a presence of an anomaly in the design pattern (fig. 8, item 808 and 810) by comparing at least one pair of the images corresponding to at least two of the different values (fig. 8, item 806).

Shykind et al does not disclose expressly that the images are aerial images. Shykind et al uses images of a printed die and that one of the different values represents a reference member value.

Ferguson et al discloses it is advantageous to take images of a mask by using aerial images (col. 7, lines 45-47) instead of using wafer exposures.

Shykind and Ferguson et al are combinable because they are from the same field of endeavor, i.e. imaging masks.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use an aerial image.

The suggestion/motivation for doing so would have been to provide a faster, more accurate method (col. 7, lines 51-52).

Shykind et al (as modified by Ferguson et al) does not disclose expressly that one of the different values represents a reference member value.

Fujimori et al discloses the use of reference data, DR, which would indicate the reference member value that is used to compare to another input data (col. 3, lines 52-65), which is paralleled to the other value of Shykind et al by use of comparison between two pieces of data, since reference data would be the data with the "ideal". In other words, Fujimori supplies the teaching that one of the images of the reticle can be a reference, thus providing an image with represents the data with the reference member value.

Shykind et al (as modified by Ferguson et al) and Fujimori et al are combinable because they are from the same field of endeavor, i.e. defect detection in electronics.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to compare to a reference value.

The suggestion/motivation for doing so would have been to provide a basis of what is the ideal, thus finding defects more quickly, and to provide a more accurate defect detection by providing multiple means of detecting defects.

Therefore, it would have been obvious to combine the method of Shykind et al (as modified by Ferguson et al) with the reference data of Fujimori et al to obtain the invention as specified in claim 1.

8. Regarding claim 3, Shykind et al discloses the member comprises exposure (fig. 8, item 806).

9. Regarding claim 4, Shykind et al discloses a multi-die reticle (fig. 3).

10. Regarding claim 5, Shykind et al discloses that the anomaly comprises a design pattern defect since a defect is detected (fig. 8, item 810) that is part of the design pattern since the defect is detected from a patterned die made from a patterning mechanism (col. 2, lines 24-26).

11. Regarding claim 6, Shykind et al discloses an anomaly that is detected comprises a reticle enhancement technique defect, since the reticle defects that are detected are enhanced in the technique described in col., 3, line 65- col. 4, line 19).

12. Regarding claim 7, Shykind et al discloses that the anomaly will print at the different values (fig 8, item 808), and that it will only print under a portion of the values because the defect will only print in the areas of the defect.

13. Regarding claim 9, Shykind et al discloses inspecting the reticle for other types of anomalies using one of the images, and also using the other in comparison (fig. 8, item 806), wherein the other types of anomalies comprise reticle manufacturing errors, wherein the reticle manufacturing errors are those errors that are sorted as a mask defects which would cause manufacturing errors, and contaminants, or the naturally occurring random defects that are different in the images (fig. 8, item 808) since this was not a cause of the reticle errors and thus does not repeat in the images. Ferguson et al discloses it is advantageous to take images of a mask by using aerial images (col. 7, lines 45-47).

14. Regarding claim 10, Shykind et al discloses that the inspecting comprises a die-to-die comparison (fig. 8, item 804 and 806).

15. Regarding claim 15, Shykind et al discloses determining a process window for a lithography process to be carried out using the reticle, the process window being the area of the process for each of the processing conditions (fig. 3).

16. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in view of Ferguson et al and Fujimori, as applied to claim 1 above, and further in view of U.S. Patent No 7133548 (Kenan et al).

Regarding claim 8, Shykind et al (as modified by Ferguson et al and Fujimori) discloses all of the claimed elements as set forth above and incorporated herein by reference.

Shykind et al (as modified by Ferguson et al and Fujimori) does not disclose expressly that the images are acquired with different detectors having the different values.

Kenan et al discloses having CCD cameras for an aerial imaging system (col. 7, lines 26-32. This is analogous to different detectors having the different values, since in a CCD camera there are many different CCD elements imaging the full object. Shykind et al's image of the full object contains the different values, as shown in fig. 3. Therefore, by using the imaging system of Kenan et al of using multiple CCD elements and cameras for each pixel with the imaging of Shykind et al, different elements/ detectors correspond to different values.

Shykind et al (as modified by Ferguson et al and Fujimori) and Kenan et al are combinable because they are from the same field of endeavor, i.e. defect detection in electronics.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use multiple detectors.

The suggestion/motivation for doing so would have been to provide an accurate way of imaging the object, thus providing a more accurate recognition later on.

Therefore, it would have been obvious to combine the method of Shykind et al (as modified by Ferguson et al and Fujimori) with the multiple detectors of Kenan et al to obtain the invention as specified in claim 8.

17. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in view of Ferguson et al and Fujimori, as applied to claim 1 above, and further in view of U.S. Patent No. 5444480 (Sumita).

Regarding claim 11, Shykind et al discloses all of the claimed elements as set forth above and incorporated herein by reference. Ferguson et al discloses it is advantageous to take images of a mask by using aerial images (col. 7, lines 45-47) instead of using wafer exposures.

Shykind et al does not disclose expressly that prior to said determining, preprocessing the at least one pair of the images to remove relatively high intensity values and relatively low intensity values from the at least one pair of the images.

Sumita discloses removing dark and bright areas of the image in a preprocessing step (col. 5, lines 8-15).

Shykind et al and Sumita are combinable because they are from the same field of endeavor, i.e. image processing in inspection systems.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to remove the high and low intensities.

The suggestion/motivation for doing so would have been to provide a contrast-enhanced image by removing areas that are too dark and too bright.

Therefore, it would have been obvious to combine the method of Shykind et al (as modified by Ferguson et al and Fujimori) with the removal of dark and bright regions, as disclosed by Sumita to obtain the invention as specified in claim 11.

18. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in view of Ferguson et al and Fujimori, as applied to claim 1 above, and further in view of U.S. Patent Application Publication No. 20020181756 (Shibuya et al).

Regarding claim 12, Shykind et al (as modified by Ferguson et al and Fujimori) discloses all of the claimed elements as set forth above and incorporated herein by reference. Shykind et al further discloses identifying regions of the reticle based on a location of the anomaly by flagging the defects, thus marking where the defects are (fig. 8, item 810).

Shykind et al (as modified by Ferguson et al and Fujimori) does not disclose expressly that the flagged regions are reviewed.

Shibuya et al discloses that flagged regions are reviewed (pg. 7, pp 86).

Shykind et al (as modified by Ferguson et al and Fujimori) and Shibuya et al are combinable because they are from the same field of endeavor, i.e. defect detection.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to review flagged defect regions.

The suggestion/motivation for doing so would have been to provide a more accurate result by verifying that the defect exists and finding the type of defect.

Therefore, it would have been obvious to combine the method of Shykind et al (as modified by Ferguson et al and Fujimori) with the review of Shibuya et al to obtain the invention as specified in claim 12.

19. Regarding claim 13, review comprises image review at varying levels of optical conditions, or varying levels of optical locations since defects are in different locations (pg. 7, pp 86). Ferguson et al discloses it is advantageous to take images of a mask by using aerial images (col. 7, lines 45-47).

20. Claims 14, 16, 27 and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in view of Ferguson et al and Fujimori et al, as applied to claim 1 above, and further in view of U.S. Patent No. 6091846 (Lin et al).

Regarding claim 14, Shykind et al (as modified by Ferguson et al and Fujimori et al) discloses all of the claimed elements as set forth above and incorporated herein by

reference. Shykind et al further discloses if there is more than one anomaly in the design pattern, the method further comprises binning the more than one anomaly by flagging the defect regions (fig. 8, item 810). This occurs if there is any amount of anomalies.

Shykind et al (as modified by Ferguson et al and Fujimori et al) does not disclose expressly that the regions proximate an anomaly is binned/ flagged.

Lin et al discloses the area surrounding a defect is stored (col. 20, lines 30-33).

Shykind et al (as modified by Ferguson et al and Fujimori et al) and Lin et al are combinable because they are from the same field of endeavor, i.e. defect detection.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to bin the area surrounding the defect.

The suggestion/motivation for doing so would have been to provide a more robust system by allowing for more information to be recorded for later evaluation.

Therefore, it would have been obvious to combine Shykind et al (as modified by Ferguson et al and Fujimori et al) with the areas surrounding the defect, as disclosed by Lin et al to obtain the invention as specified in claim 14.

21. Regarding claim 16, Lin et al discloses determining a critical status of the anomaly, by classifying the defect (fig. 19).

22. Claims 27 and 28 are rejected for the same reasons as claim 14. Thus, the arguments analogous to that presented above for claim 14 are equally applicable to claims 27 and 28. Claims 27 and 28 distinguishes from claim 27 only in that they reword "according to regions of the reticle proximate the...anomaly" to "by appearance

of regions of the reticle immediately surrounding the defects" and "by patterns surrounding the defects" respectively. Lin et al teaches these features, since the anomaly area immediately surrounding the defect is stored, the appearance of the regions around the defect and the patterns around the defects are stored as well.

23. Claims 1, 3-7, 9, 10, 12, 13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind in combination with U.S. Patent No. 6757645 (Chang et al).

24. Regarding claim 17, Shykind et al discloses a method, comprising: acquiring images of a reticle (fig. 3) containing a design pattern by a detection circuit (fig.2, item 204), wherein the images are acquired for different values of a member of a set of lithographic variables (fig. 8, item 300), the different values of a member of a set of lithographic variables being the different process conditions such as exposure time and focus setting; comparing at least one pair of the images corresponding to at least two of the different values (fig. 8, item 806); to find areas on the reticle in which anomalies in the design pattern are located (fig. 8, item 808 and 810).

Shykind et al does not disclose expressly that the images are aerial images. Shykind et al uses images of a printed die. Furthermore, Shykind does not expressly disclose determining which of the areas on the reticle where a lithography process using the reticle is most susceptible to failure based on the results of finding the anomaly-areas.

Chang et al discloses it is advantageous to take images of a mask by using aerial images (col. 9, lines 30-35) instead of using wafer exposures. Furthermore, Chang et al discloses determining which of the areas of the anomaly areas are most susceptible to failure once the anomaly areas are found (col. 19, lines 62-67).

Shykind and Chang et al are combinable because they are from the same field of endeavor, i.e. imaging masks.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use an aerial imaging and to determine areas most susceptible to failure.

The suggestion/motivation for doing so would have been to provide a faster, more economical method.

Therefore, it would have been obvious to combine the method of Shykind et al with the aerial imaging of Chang et al to obtain the invention as specified in claim 7.

25. Regarding claim 18, Chang et al also discloses having different values for a mask (col. 12, lines 5-10) one of the different values represents a reference member value in which a simulated reference image results (fig. 6b and col. 5-6 lines 66-2).

26. Regarding claim 1, Chang et al discloses acquiring aerial images of a reticle containing a design pattern (col. 5, lines 9-11), wherein the aerial images are acquired the different values of a member of a set of lithographic variables, such as etching process parameters and adding a second mask (col. 5, lines 42-45 and col. 5, lines 60-65), and wherein one of the different values represents a reference member value, the values that are used to get the reference image; and comparing at least one pair of the

aerial images corresponding to at least two of the different values (col. 6, lines 5-11), wherein one of the at least two of the different values represents the reference member value.

Chang et al does not expressly disclose that a presence of an anomaly in a design pattern is found by comparing two of the images. Chang et al does disclose finding the presence of an anomaly (col. 5, line 4).

Shykind et al discloses comparing at least one pair of the images corresponding to at least two of the different values (fig. 8, item 806); to find areas on the reticle in which anomalies in the design pattern are located (fig. 8, item 808 and 810).

27. Regarding claim 3, Chang et al discloses that the member comprises illumination focus, exposure and illumination mode (col. 9, lines 48-56). Shykind et al discloses the member comprises exposure (fig. 8, item 806).

28. Regarding claim 4, Shykind et al discloses a multi-die reticle (fig. 3).

29. Regarding claim 5, Shykind et al discloses that the anomaly comprises a design pattern defect since a defect is detected (fig. 8, item 810) that is part of the design pattern since the defect is detected from a patterned die made from a patterning mechanism (col. 2, lines 24-26).

30. Regarding claim 6, Shykind et al discloses an anomaly that is detected comprises a reticle enhancement technique defect, since the reticle defects that are detected are enhanced in the technique described in col., 3, line 65- col. 4, line 19).

31. Regarding claim 7, Chang et al discloses that anomalies that are detected are transient repeating defects that will print under only a portion of the different values (col. 12, lines 7-10)

32. Regarding claim 9, Shykind et al discloses inspecting the reticle for other types of anomalies using one of the images, and also using the other in comparison (fig. 8, item 806), wherein the other types of anomalies comprise reticle manufacturing errors, wherein the reticle manufacturing errors are those errors that are sorted as a mask defects which would cause manufacturing errors, and contaminants, or the naturally occurring random defects that are different in the images (fig. 8, item 808) since this was not a cause of the reticle errors and thus does not repeat in the images. Ferguson et al discloses it is advantageous to take images of a mask by using aerial images (col. 7, lines 45-47).

33. Regarding claim 10, Shykind et al discloses that the inspecting comprises a die-to-die comparison (fig. 8, item 804 and 806).

34. Regarding claim 12, Chang et al discloses that after defects are identified, reviewing the regions based on the location of the anomaly (fig. 8, steps 840 and 845), sine the regions of the anomaly are reviewed it see if they can be repaired, are totally unusable, or undecided. Furthermore, the areas are reviewed to check to see the printability of the defect (col. 12, lines 5-10).

35. Regarding claim 13, Chang et al discloses that the review comprises aerial image review at varying levels of optical conditions (col. 12, lines 7-10).

36. Regarding claim 15, Chang et al discloses finding a process window for a lithography process to be carried out using the reticle (col. 12, lines 7-10).

37. Regarding claim 16, Chang et al discloses finding the critical status of the anomaly (fig. 8, steps 840 and 845)

38. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in combination with Chang et al, as applied to claim 1 above, and further in view of U.S. Patent No 7133548 (Kenan et al).

Regarding claim 8, Shykind et al and Chang et al disclose all of the claimed elements as set forth above and incorporated herein by reference.

Shykind et al and Chang et al donot disclose expressly that the images are acquired with different detectors having the different values.

Kenan et al discloses having CCD cameras for an aerial imaging system (col. 7, lines 26-32. This is analogous to different detectors having the different values, since in a CCD camera there are many different CCD elements imaging the full object. Shykind et al's image of the full object contains the different values, as shown in fig. 3. Therefore, by using the imaging system of Kenan et al of using multiple CCD elements and cameras for each pixel with the imaging of Shykind et al, different elements/ detectors correspond to different values.

Shykind et al, Chang et al and Kenan et al are combinable because they are from the same field of endeavor, i.e. defect detection in electronics.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use multiple detectors.

The suggestion/motivation for doing so would have been to provide an accurate way of imaging the object, thus providing a more accurate recognition later on.

Therefore, it would have been obvious to combine the method of Shykind et al and Chang et al with the multiple detectors of Kenan et al to obtain the invention as specified in claim 8.

39. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in combination with Chang et al, as applied to claim 1 above, and further in view of U.S. Patent No. 5444480 (Sumita).

Regarding claim 11, Shykind et al and Chang et al discloses all of the claimed elements as set forth above and incorporated herein by reference. Ferguson et al discloses it is advantageous to take images of a mask by using aerial images (col. 7, lines 45-47) instead of using wafer exposures.

Shykind et al and Chang et al does not disclose expressly that prior to said determining, preprocessing the at least one pair of the images to remove relatively high intensity values and relatively low intensity values from the at least one pair of the images.

Sumita discloses removing dark and bright areas of the image in a preprocessing step (col. 5, lines 8-15).

Shykind et al and Chang et al and Sumita are combinable because they are from the same field of endeavor, i.e. image processing in inspection systems.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to remove the high and low intensities.

The suggestion/motivation for doing so would have been to provide a contrast-enhanced image by removing areas that are too dark and too bright.

Therefore, it would have been obvious to combine the method of Shykind et al and Chang et al with the removal of dark and bright regions, as disclosed by Sumita to obtain the invention as specified in claim 11.

40. Claims 14, 27 and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in combination with Chang et al, as applied to claim 1 above, and further in view of U.S. Patent No. 6091846 (Lin et al).

Regarding claim 14, Shykind et al and Chang et al disclose all of the claimed elements as set forth above and incorporated herein by reference. Shykind et al further discloses if there is more than one anomaly in the design pattern, the method further comprises binning the more than one anomaly by flagging the defect regions (fig. 8, item 810). This occurs if there is any amount of anomalies.

Shykind et al and Chang et al do not disclose expressly that the regions proximate an anomaly is binned/ flagged.

Lin et al discloses the area surrounding a defect is stored (col. 20, lines 30-33).

Shykind et al, Chang et al and Lin et al are combinable because they are from the same field of endeavor, i.e. defect detection.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to bin the area surrounding the defect.

The suggestion/motivation for doing so would have been to provide a more robust system by allowing for more information to be recorded for later evaluation.

Therefore, it would have been obvious to combine Shykind et al and Chang et al with the areas surrounding the defect, as disclosed by Lin et al to obtain the invention as specified in claim 14.

41. Claims 27 and 28 are rejected for the same reasons as claim 14. Thus, the arguments analogous to that presented above for claim 14 are equally applicable to claims 27 and 28. Claims 27 and 28 distinguishes from claim 27 only in that they reword "according to regions of the reticle proximate the...anomaly" to "by appearance of regions of the reticle immediately surrounding the defects" and "by patterns surrounding the defects" respectively. Lin et al teaches these features, since the anomaly area immediately surrounding the defect is stored, the appearance of the regions around the defect and the patterns around the defects are stored as well.

42. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shykind et al in combination with Chang et al, as applied to claim 18 above, and further in view of Fujimori et al.

Shykind et al and Chang et al disclose all of the claimed elements as set forth above and incorporated herein by reference. Shykind et al further discloses that the area that comprises anomalies are common to the at least one pair of the images not acquired at the reference member value, or images at random different exposure times (fig. 8, item 808) since the mask defects are the defects that are common in multiple dice. Since these are areas that are flagged to be defects, and Chang et al labels the areas that are most susceptible to failure from these defects, the areas that are most susceptible to failure are found from Shykind et al's comparison.

Shykind et al and Chang et al does not disclose expressly that the anomalies that are found are not common to the aerial image acquired at the reference member value. Chang et al implies that the defects are found are not common to the aerial image acquired at the reference member value since Chang uses the reference member value to find the correct illumination parameters for the mask where the defect will not print (col. 6, lines 12-15), which implies that defects are found that are not common between the reference image and other illumination parameter images, but is not explicitly stated.

Fujimori et al discloses that the area comprises anomalies that are not common to the aerial image acquired at the reference member value, since Fujimori et al finds the differences between the reference and the input in order to find anomalies (col. 4, lines 30-33).

Shykind et al, Chang et al and Fujimori et al are combinable because they are from the same field of endeavor, i.e. defect detection in electronics.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the comparison of the reference to the test image to find defects.

The suggestion/motivation for doing so would have been to allow a more robust, direct system by providing a direct comparison of data.

Therefore, it would have been obvious to combine Shykind et al and Chang et al with the direct comparison of the aerial image to the reference member value to find the anomalies of Fujimori to obtain the invention as specified in claim 19.

Allowable Subject Matter

43. Claims 20-26 are allowed.

44. The following is an examiner's statement of reasons for allowance: Claim 26 claims specifics regarding the transient repeating defects being defects that will print under only a portion of the different values, and that they are found by finding non-transient defects and subtracting the non-transient defects from the aerial images that are found with different values of a member of a set of lithographic variables. Furthermore, the aerial images are compared to each other.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

45. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 12/18/2007 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen S. Yuan whose telephone number is (571)272-2902. The examiner can normally be reached on Monday to Thursdays, 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KY
1/30/2008

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